**OUTLINE SHEET 4-13-1**
Packing and Gasket Replacement Laboratory

A. Introduction

Most of the maintenance accomplished by shipboard engineers involve replacement of packing and gaskets. This laboratory will allow you to practice the lessons learned in maintaining shipboard equipment.

B. Enabling Objectives

4.37 **REPLACE** gasket in low pressure piping system given the necessary materials and tools.

4.38 **REPACK** valve in low pressure piping system given the necessary materials and tools.

C. Topic Outline

1. Introduction
2. Overview
3. Perform Job Sheet 4-13-3

**ASSIGNMENT SHEET 4-13-2**
Packing and Gasket Replacement Laboratory

A. Introduction

This material is to be completed prior to the material being covered in class.

B. Enabling Objectives

Refer to enabling objectives in Outline Sheet 4-13-1.

C. Study Assignment

1. None

D. Study Questions

1. None

**JOBSHEET 4-13-3**
Packing and Gasket Replacement Laboratory

A. Introduction

Cold iron watchstanders must be able to perform assigned tasks quickly and effectively. This jobsheet will allow you to practice the step-by-step procedures required to stand a cold iron watch.

B. Equipment. The following equipment is required:

1. Student Laboratory Guide for Packing and Gasket Replacement
2. Valve Inspection Checklist
3. various sized wrenches
4. scissors
5. hammer
6. gasket punch
7. wood block
8. packing puller
9. packing
10. gasket
11. bench vise, machinist
12. hydrotest pump
13. laminated Danger tags
14. tag-out sheets
15. grease pencil
16. crocus cloth #60 or F6

C. References:

None

D. Safety precautions:

1. Review TTO procedures in the Safety/Hazard Awareness Notice.
2. Do NOT to operate any equipment without the permission of the watch supervisor.

E. Job Steps:

1. Conduct an external inspection using Valve Inspection Checklist.

2. Disassemble:

   a. Close valve by turning handwheel clockwise; then open the valve 1/2.

   **WARNING: Ensure that the piping system is not pressurized.**

   b. Remove handwheel nut.
   c. Remove handwheel.
   d. Remove packing nut.
   e. Remove packing gland.
   f. Remove old packing from stuffing box.
   g. Unscrew bonnet by turning it counterclockwise.
   h. Mark the body and wedge on the same side using a grease pencil.
   I. Remove the wedge and stem from bonnet by turning the stem counterclockwise while holding the wedge and bonnet.

**CAUTION: Exercise care not to damage the seating surfaces of the wedge. Remove the bonnet from the body.**

3. Inspect internal parts:

   a. Inspect stem for nicks, pitting, scratches, grooves, or shoulders on the stem surface.
   b. Inspect valve stem for burrs.
   c. Inspect and clean stuffing box, using crocus.
   d. Inspect and clean the guide ribs and wedge guides.

4. Re-assemble:

   a. Insert the stem through the top of the bonnet.
   b. Place the stuffing box over the stem and tighten.
   c. Place gate on the stem and retract gate into the recessed area of bonnet. Ensure markings on the body and the gate are aligned.
   d. Place the bonnet on the body. Ensure that ribs and guide slots are aligned, then tighten bonnet.

5. Repack valve.

   a. Slide the packing the down the stem into the stuffing box.
   b. Push the packing rings firmly into the stuffing box. Packing must fit completely around the stem, and with a 45 degree overlap at the joint to form a continuos ring. If the stuffing box contains four or more rings, stagger the joints at 90 degrees. If the stuffing box contains less than four rings, stagger the joints at 120 degrees.
   c. Add more packing rings until the top packing ring is not more than 1/8 inch below the top of the stuffing box.
   d. Place the packing gland on the stem and tighten hand tight.
   e. Place handwheel on the stem and secure with the handwheel nut and washer.
   f. Tighten packing gland nut until slight drag is felt while turning the handwheel.
   g. Cycle valves open and shut to break-in packing.
   h. Re-tighten packing gland nut until slight drag is felt while turning the handwheel.

6. Replace flange gasket:

   a. Remove valve from the piping.
   b. Remove gasket from the flanges.
   c. Install new gaskets.
   d. Ensure that the nut and bolts on the flanges are tightened in a crossing pattern.
   e. Clear the tags.
   f. Ask Instructor to hydrotest the valve.